IN THE CLAIMS

Please amend the Claims as follows:

1. (original) A method of preparing a hydrogel immobilised to a solid support comprising polymerising on said support a mixture of:

(i) a first comonomer which is acrylamide, methacrylamide, hydroxyethyl methacrylate or N-vinyl pyrrolidinone; and

(ii) a second comonomer which is a functionalised acrylamide or acrylate of formula (I):

$H_2C=C(H)-C(=O)-A-B-C$ (I);

or a methacrylate or methacrylamide of formula (II):

or $H_2C=C(CH_3)-C(=O)-A-B-C-$(II)

(wherein:

A is NR or O, wherein R is hydrogen or an optionally substituted saturated hydrocarbyl group comprising 1 to 5 carbon atoms;

-B- is an optionally substituted alkylene biradical of formula $-(CH_2)_n-$ wherein n is an integer from 1 to 50; and wherein n = 2 or more, one or more optionally substituted ethylene biradicals $-CH_2CH_2-$ of said alkylene biradical may be independently replaced by ethenylene and ethynylene moieties; and wherein n=1 or more, one or more methylene biradicals $-CH_2-$ may be replaced independently with an optionally substituted mono- or polycyclic hydrocarbon biradical comprising from 4 to 50 carbon atoms, or a corresponding heteromonocyclic or heteropolycyclic biradical wherein at least 1 CH_2 or CH_2 is substituted by an oxygen sulfur or nitrogen atom or an NH group; and

C is a group for reaction with a compound to bind said compound covalently to said hydrogel) to form a polymerised product,

characterised in that said method is conducted on, and immobilises the polymerised product to, said support which is not covalently surface-modified.

2. (original) The method as claimed in claim 1 wherein said support is a silica-based support.

3. (original) The method as claimed in claim 2 wherein said silica-based support is fused silica.

4. (original) The method as claimed in claim 3 wherein said silica fused silica is SPECTRASIL™.

5. (original) The method as claimed in claim 1 wherein said support is a non silica-based support.

6. (currently amended) A method as claimed in ~~any preceding~~ claim 1 wherein said first comonomer is acrylamide.

7. (currently amended) A method as claimed in ~~any preceding~~ claim 1 wherein said second comonomer is an acrylamide of formula (I).

8. (original) A method as claimed in claim 6 wherein said acrylamide of formula (I) has A = NH.

9. (currently amended) A method as claimed in ~~any preceding~~ claim 1 wherein -B- is a C_2-C_{10} alkylene biradical.

10. (original) The method as claimed in claim 8 wherein -B- is $-(CH_2)_5-$.

11. (currently amended) The method as claimed in ~~any preceding~~ claim 1 wherein C is hydroxyl, thiol, amine, acid, ester or haloacetamido.

12. (original) The method as claimed in claim 11 wherein said haloacetamido is bromoacetamido.

13. (currently amended) The method as claimed in ~~any one of~~ claim[[s]] 1 ~~to 8~~ wherein said acrylamide of formula (I) is *N*-(5-bromoacetamidylpentyl) acrylamide (BRAPA).

14. (currently amended) The method as claimed in ~~any preceding~~ claim 1 wherein said second comonomer is present in an amount of ≥1 mol% relative to the total molar quantity of comonomers.

15. (original) The method as claimed in claim 14 wherein said second comonomer is present in an amount of ≥2 mol% relative to the total molar quantity of total comonomers.

16. (currently amended) The method as claimed in ~~any preceding~~ claim 1 wherein no polyunsaturated crosslinking agent is present during said polymerising.

17. (currently amended) A solid-supported hydrogel obtainable according to the method of ~~any one of the preceding~~ claim[[s]] 1.

18. (original) The solid-supported hydrogel of claim 17 wherein the thickness of the hydrogel is less than 100 nm.

19. (currently amended) A method of preparing a solid supported hydrogel-based molecular array, said method comprising reacting one or more molecules of interest with reactive sites present in a solid-supported hydrogel as defined in claim 17 ~~or claim 18~~.

20. (original) The method of claim 19 wherein said molecules of interest are biomolecules.

21. (currently amended) The method of claim 19 ~~or claim 20~~ wherein said molecules of interest are polynucleotides or proteins.

22. (original) The method of claim 21 wherein said molecules of interest are polynucleotides.

23. (original) The method of claim 22 wherein at least a portion of each polynucleotide is single-stranded.

24. (currently amended) The method of claim 22 ~~or claim 23~~ wherein said polynucleotides comprise from 1 to 20 spacer nucleotides.

25. (original) The method of claim 24 wherein said polynucleotides comprise from 1 to 10 spacer nucleotides.

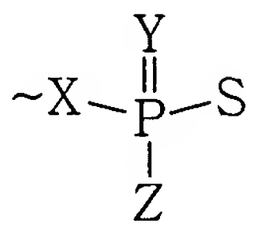
26. (original) The method of claim 25 wherein said polynucleotides comprise 10 spacer nucleotides.

27. (currently amended) The method of ~~any one of~~ claim[[s]] 24 ~~to 26~~ wherein said spacer nucleotides each contain the base thymine (T).

28. (currently amended) The method of claim 22 ~~or claim 23~~ wherein said polynucleotides are hairpin polynucleotides.

29. (currently amended) The method of ~~any one of~~ claim[[s]] 19 ~~to 28~~ wherein said molecules of interest contain a sulfur-containing nucleophile.

30. (original) The method of claim 29 wherein said sulfur-containing nucleophile is a moiety of the formula (III):



(III)

(wherein ~ denotes the bond or linker connecting the sulfur-based nucleophile to the remainder of the polynucleotide; X represents an oxygen atom, a sulfur atom or a group NR, in which R is hydrogen or an optionally substituted C_{1-10} alkyl; Y represents an oxygen or a sulfur atom; and Z represents an oxygen atom, a sulfur atom or an optionally substituted C_{1-10} alkyl group).

31. (original) The method of claim 30 wherein X is oxygen or sulfur.

32. (currently amended) The method of claim 30 ~~or claim 31~~ wherein Y is oxygen.

33. (currently amended) The method of ~~any one of~~ claim[[s]] 30 ~~to 32~~ wherein Z is an oxygen or sulfur atom or a methyl group.

34. (currently amended) The method of ~~any one of~~ claim[[s]] 30 ~~to 33~~ wherein said moiety is thiophosphate.

35. (currently amended) The method of ~~any one of~~ claim[[s]] 29 ~~to 34~~ wherein said sulfur-containing nucleophile is connected to the molecule of interest by a linker group and wherein said molecule of interest is a polynucleotide.

36. (currently amended) A method of preparing a solid supported hydrogel-based molecular array which is a clustered array of molecules of interest, the method comprising:

(i) reacting polynucleotide molecules with reactive sites present in a solid-supported hydrogel according to the method of ~~any one of~~ claim[[s]] 22 ~~to 27~~, wherein said polynucleotide molecules are first and second oligonucleotide primers capable of hybridising to a template to be amplified;

(ii) contacting the first oligonucleotide primers attached to the solid-supported hydrogel in step (i) with one or more templates to be amplified under conditions which permit hybridisation of the templates to the oligonucleotide primers, each template comprising at the 3' end a sequence capable of hybridising to the first oligonucleotide primer and at the 5' end a sequence the complement of which is capable of hybridising to a second oligonucleotide primer; and

(iii) performing one or more nucleic acid amplification reactions using the first and second oligonucleotide primers and the template(s), thereby generating a clustered array of molecules of interest.

37. (original) A method of modifying a molecular array, which molecular array comprises a plurality of molecules of interest immobilised to a surface of a support, said method comprising the step of applying to the array polyelectrolyte or neutral polymers.

38. (currently amended) The method of claim 37 wherein said molecules of interest are biomolecules. ~~as defined in any one of claims 20 to 36.~~

39. (currently amended) The method of claim 37 ~~or claim 38~~ wherein the support is comprised of a member selected from the group comprising silica-based substrates, hydrogels and polyelectrolyte multilayers.

40. (original) The method of claim 39 wherein the molecules of interest are attached directly or through a linking moiety to a silica-based support.

41. (original) The method of claim 39 wherein the hydrogel is a polyacrylamide hydrogel.

42. (original) The method of claim 39 wherein the polyelectrolyte multilayer comprises one or more layers of each of polyallylamine and polyacrylic acid wherein the surface to which the biomolecules are attached comprises polyacrylic acid.

43. (original) The method of claim 39 wherein the hydrogel is obtainable by a method comprising polymerising on a solid support a mixture of:

(i) a first comonomer which is acrylamide, methacrylamide, hydroxyethyl methacrylate or N-vinyl pyrrolidinone; and

(ii) a second comonomer which is a functionalised acrylamide or acrylate of formula (I):

$$H_2C=C(H)-C(=O)-A-B-C \text{ (I);}$$

or a methacrylate or methacrylamide of formula (II):

$$\text{or } H_2C=C(CH_3)-C(=O)-A-B-C-\text{(II)}$$

(wherein:

A is NR or O, wherein R is hydrogen or an optionally substituted saturated hydrocarbyl group comprising 1 to 5 carbon atoms;

-B- is an optionally substituted alkylene biradical of formula $-(CH_2)_n-$ wherein n is an integer from 1 to 50; and wherein n = 2 or more, one or more optionally substituted ethylene biradicals $-CH_2CH_2-$ of said alkylene biradical may be independently replaced by ethenylene and ethynylene moieties; and wherein n=1 or more, one or more methylene biradicals $-CH_2-$ may be replaced independently with an optionally substituted mono- or polycyclic hydrocarbon biradical comprising from 4 to 50 carbon atoms, or a corresponding heteromonocyclic or heteropolycyclic biradical wherein at least 1 CH_2 or CH_2 is substituted by an oxygen sulfur or nitrogen atom or an

NH group; and

C is a group for reaction with a compound to bind said compound covalently to said hydrogel) to form a polymerised product wherein said polymerising is conducted on, and immobilises the polymerised product to, said solid support.

44. (currently amended) The method of claim 43 wherein the said solid support is not covalently surface-modified. ~~hydrogel is obtainable by a method as defined in any one of claims 1 to 16.~~

45. (currently amended) The method of ~~any one of~~ claim[[s]] 37 ~~to 44~~ wherein the polyelectrolyte applied is polyacrylic acid.

46. (currently amended) The method of ~~any one of~~ claim[[s]] 37 ~~to 45~~ wherein polyallylamine is applied to the array followed by polyacrylic acid.

47. (currently amended) The method of ~~any one of~~ claim[[s]] 37 ~~to 44~~ wherein the neutral polymer is polyethylene glycol.

48. (currently amended) The method of ~~any one of~~ claim[[s]] 37 ~~to 47~~ wherein the method comprises modifying a microarray or a single molecule array.

49. (original) The method of claim 48 wherein the method comprises modifying a single molecule array.

50. (original) The method of claim 48 wherein the method comprises modifying a clustered microarray.

51. (currently amended) A molecular array obtainable according to the method of ~~any one~~

~~of~~ claim[[s]] 19 ~~to 50~~.

52. (original) The molecular array of claim 51 which is a single molecule array.

53. (original) The molecular array of claim 51 which is a clustered microarray.

54. canceled

55. canceled

56. canceled

57. canceled

58. canceled

59. canceled

60. canceled